

Message to Energy Managers

Fleet Logistics Support Squadron 57 (VR-57) won double conservation honors, earning FEMP and SECNAV awards in 2001. VR-57 reduced their fuel use by 23%, saving nearly \$833,000. Their energy managers implemented energy conservation practices learned during California's energy crisis.

Naval Support Activity Mid-South is also a winner, earning a FEMP award in 2001. Mid-South financed their three-part Demand-side Management project through a buy-down funds agreement with the local utility companies, which provided \$1.3 million for the project.

In scientific news, researchers at Oak Ridge National Laboratory report the possibility of nuclear reactions during the explosive collapse of bubbles in liquid. This could mean the availability of reliable, inexpensive, and pollution-free energy.

And researchers at ONR are studying characteristics of several animals because of their ability to achieve high-lift. There is potential that these capabilities can help ships become more energy efficient.

Finance Wizardry is a FEMP Winner at Mid-South

When they rolled out the names of 2001 Federal Energy and Water Management (FEMP) Award winners this past October, it came as no surprise to DON energy managers that Naval Support Activity (NAVSUP-PACT) Mid-South was among those honored.

Mid-South, located not far from the Mississippi River north of Memphis, is gaining a reputation for its able and creative financial expertise in funding major energy conservation initiatives.

FEMP hailed energy managers at Mid-South for their adept use of alternative financing. FEMP officials said that Mid-South's work provides a model that can be replicated at federal facilities around the world.

"The fact that the Department of the Navy has demonstrated such a commitment to energy and water conservation is indicative of Navy and Marine Corps leadership and their resourcefulness in adapting to changing times," said Mid-South's Commanding Officer. "The focus is on the future. I am honored to accept this prestigious national award on behalf of our installation and to publicly acknowledge the hard work of our Energy Manager."

FEMP applauded the installation's use of alternative financing to implement major energy conservation upgrades. The command completed a \$13.2 million, three-part Demand-side Management (DSM) project in 2000 which included replacing the central steam plant with package boilers, installing electronic energy management controls, and conducting sweep-lighting upgrades.

Rather than attempt the project out-of-pocket that would have resulted in a scaled-back, piecemeal and less effective energy



Mid-South's Energy Manager accepts FEMP Award

program, Mid-South entered into a buy-down funds agreement with Tennessee Valley Authority (TVA) and Memphis Light Gas & Water (MLG&W) which provided \$1.3 million for the project. Energy managers say that the work paid immediate dividends. The project saves 286,000 MBTU and \$1.7 million in annual energy and maintenance costs.

Before upgrades, its steam plant used more than 101,000 MBTU of natural gas. Afterwards, consumption for the same comparable period had dropped to nearly 19,000 MBTU, based on actual utility bills. The work also resulted in annual savings of 19.1 million gallons of potable water. And anyone who breathes air in the vicinity can thank energy managers and the upgrade project: project

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DON Energy Awareness Website: Access the tools on the Navy Energy website for ideas, planning tips, and tools. Set your browser to <<http://energy.navy.mil>> and scroll down the left-hand column to the Awareness pick.

Fusion in a Bottle?

If a new discovery bears fruit, DON energy managers could one day witness an astounding sea change in the availability of reliable, cheap, and pollution-free energy.

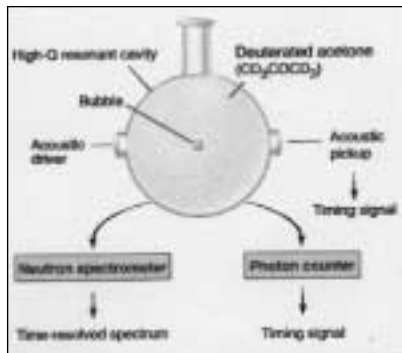
Researchers at Oak Ridge National Laboratory, Rensselaer Polytechnic Institute and the Russian Academy of Sciences report the possibility of nuclear reactions during the explosive collapse of bubbles in liquid. Theoretical estimates of the conditions in the collapsing bubbles are consistent with the possibility of nuclear fusion. The findings were announced in a peer-reviewed publication in March.

The bubbles, which grow in the presence of sound waves, collapse to produce locally high pressures and temperatures. These pressures and temperatures can be sufficiently high to result in light emissions, called sonoluminescence, from the collapsing bubbles.

The collaboration was led by Rusi Taleyarkhan, a senior scientist in ORNL's Engineering Science and Technology Division, and Richard Lahey Jr., a professor of engineering at Rensselaer. The team used 14 million electron volt (MeV) neutrons shot into the liquid by a pulsed neutron generator.

These special conditions are believed to result in a significant increase in the final pressure of the collapsing bubbles. This suggests the possibility of producing densities and temperatures necessary for nuclear reactions. In particular, a long-sought goal of sonoluminescence research has been the possibility of achieving nuclear reaction conditions.

Experiments suggest the presence of small but statistically significant



Nature Provides Energy-Efficient Models

Why is the Office of Naval Research (ONR) studying hawkmoths, boxfish and wrasse? Among the potential long-term payoffs: more energy efficient ships that could save vast energy supplies. Over millions of years, each animal has achieved high-lift in its respective medium. They move quickly, with stability and less heave, pitch, yaw, torque, drag and cavitation than man-made machines can duplicate. These characteristics could result in more navigable, energy-efficient vessels.



Spotted boxfish

ONR is studying biomimetic materials like elastic polymers and shape memory alloys (SMAs) to see how they can be used to mimic muscle propulsion, and studies are underway to compartmentalize these motions and develop modules to produce a desired navigational motion and control it.

To do this, researchers are studying—among other things—how the rigid-body boxfish turns on a dime, how the fruit fly recovers from delayed stall, and how the hungry hawkmoth stays on target in mid-air while feeding.

“The unchanging body shape of the wrasse during straight ahead swimming, for instance, is not so unlike the Navy’s rigid submersibles with one big exception,” says ONR’s primary investigator on the wrasse at the Naval Research Laboratory. “The wrasse propels itself at very high forward speeds using only its remarkable pectoral fins, which also generate substantial lift and thrust even at low speeds. In rough seas at low forward speed and shallow submergence, big cylinders like submarines don’t hold position or maneuver too well, but fish seem to have figured it out. The wrasse fin offers promise as a low-speed UUV thrust generation mechanism.”

“All these biological species are able to do what we can’t do yet, but would like to,” says another ONR researcher. “The Navy is very interested.”

For more information on this story, or to interview the researchers if you are media, please contact <cleereg@onr.navy.mil>. Images of the critters mentioned above are located at: <<http://www.onr.navy.mil/onr/media/download.htm>>.

amounts of tritium above background resulting from the bubble (cavitation) experiments using chilled, neutron-shot acetone. Shooting the acetone with neutrons produces a little bit of radioactive deuterium. This tritium could result from the nuclear fusion of two deuterium nuclei. Tritium was not observed in tests with normal acetone, which does not contain deuterium.

Attempts to confirm these results by looking for the telltale neutron signature of the deuterium fusion reaction yielded mixed results. While there are indications of neutron emission in the newly published results, subsequent experiments with a different detector system show no

neutron production.

“These results suggest the need for additional experiments to clarify the difference in the two sets of measurements,” said ORNL’s Lee Riedinger, deputy director for Science and Technology. “Additional experiments would also allow a better understanding of the tritium observations.”

Until confirming experiments are complete, he said, caution is the word of the day.

Read more about it (including the article, Q&A with researchers, and other material) at:

<http://www.ornl.gov/Press_Releases/headline.html>.

Thumbs-Down to Energy Waste at VR-57

Fleet Logistics Support Squadron 57 (VR-57), based on Naval Air Station North Island, San Diego, CA, operates four Navy C-9B aircraft specially equipped to provide worldwide logistics support to the U.S. military. The Squadron's aircrew and maintenance personnel are primarily made up of reservists from San Diego and surrounding communities. It is a group that clearly goes the extra mile to fulfill all aspects of its mission, including smart use of energy and energy dollars.



Navy Aircraft at VR-57

In fact, the dedication to energy conservation that resulted in a 23% reduction in fuel use and savings of nearly \$833,000 in FY00 resulted in twin national conservation honors for VR-57. VR-57 is a winner of Federal Energy and Water Management (FEMP) and Secretary of the Navy (SECNAV) Energy Awards.

Energy managers and personnel at VR-57 brought energy conservation practices, learned during California's energy crisis, to the Squadron in an



effective effort to reduce energy consumption and save taxpayer money.

"As a command, we strive to do our part in making efficient use of all our energy resources," said VR-57's Commanding Officer. "We have an obligation to spend tax dollars wisely. Living in Southern California, we have become acutely aware of how valuable our limited energy resources are."

VR-57 implemented energy conservation measures at all organizational levels in 2000. The command's recycling program salvaged more than 80% of paper and aluminum cans consumed by the Squadron. An energy-monitoring program minimized energy consumption by securing, electric and electronic equipment including HVAC, and unused and unnecessary lighting, including hangar lighting. Personnel received extensive energy conservation program training, and the Squadron made communication and education a high priority.

In addition, VR-57 realized exceptional gains in jet fuel conservation by combining operational flights and training missions, thus reducing flight time and fuel consumption; by carefully tailoring fuel loads; minimizing wasted time in landing patterns and ground idle;



Secured hangar lighting at VR-57

and by eliminating circumnavigation of foreign airspace through careful planning.

How effective were these initiatives? By the end of the fiscal year, this kind of coordinated operational planning saw the Squadron reduce training hours by nearly 40% (compared to 1995), realizing energy savings of more than \$186,000. It completed its mission using 22% less flight time, reducing its operational and maintenance time by nearly one-fourth, saving nearly \$650,000.

This kind of success can be traced, in part, to effective communications. California's lot in recent energy crises triggered energy awareness and training, and played a role in base-wide energy education. Communication efforts included the placement of energy conservation signage. Squadron personnel are constantly exposed to energy conservation training. Weekly written communications and discussions along the chain-of-command keep all personnel alert to opportunities for saving.

VR 57's success comes in a year in which DON energy and water conservation programs out-performed all other Federal entities in the prestigious annual FEMP awards competition. Based on their success, the Squadron is making plans to share its energy conservation procedures and planning ideas with other nearby Commands.

Mid-South, from page 1

managers point to considerable reductions in emissions from shutting down old boilers, one of which was 60 years old.

Mid-South's work has gained attention beyond FEMP. Its energy conservation and environmental gains have been the subject numerous base news articles, which helped to spread the energy awareness ideal throughout the command. But thanks to energy manager and PAO efforts, The Memphis Commercial Appeal—Memphis' largest newspaper—and other publications in the area, have written about and applauded their work.

Golden Heroes

Bonneville Power Administration has recognized some of its customers for achieving 10% load reductions. It calls these customers "Golden Heroes." Its latest list of Golden Heroes includes Navy activities at Bangor, Bremerton, and Jim Creek in the State of Washington. Congratulations to all!

Check It Out



A Little Help From My Friends...

For those interested in a bit of outside insight, here are a few upcoming meetings that may be useful:

2002 Energy, 02-05 June, Palm Springs, CA. Workshop and expo for Federal, state, local and private sector energy managers. Organized by Pentagon Energy Office and sponsored by DOE & FEMP, co-sponsored by DoD and GSA. Info and registration, 800-395-8574 or www.energy2002.ee.doe.gov

2002 West Coast Energy Management Congress Conference & Expo, 6-7 June, Anaheim CA Convention Center. Market direction, applying latest technologies to reduce costs, discovery of energy management & facilities strategies to improve operations and productivity. \$795; organized by Association of Energy Engineers. Info: 770-279-4388.

Ensuring Power Quality in a Deregulated Environment, 11-13 June, Madison, WI. A course in impacts of deregulation; control harmonics; uninterruptible power supplies; proper grounding. Conducted by University of Wisconsin-Madison. Info: John Raksany, 800-462-0876.

Teaming for Efficiency, 18-23 August, Pacific Grove, CA. Presentations and meetings in promoting building energy efficiency, technology, policy and programs. \$600; organized by American Council for an Energy Efficient Economy. Info: Rebecca Lunetta, 302-292-3966.



Watts News?

We want to hear from you.

Tell us about the energy initiatives you're working on, the problems you encounter, and the solutions you discover.

Submit article ideas, comments, or questions to:

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